INSIDE THIS PACK

FACT FILES

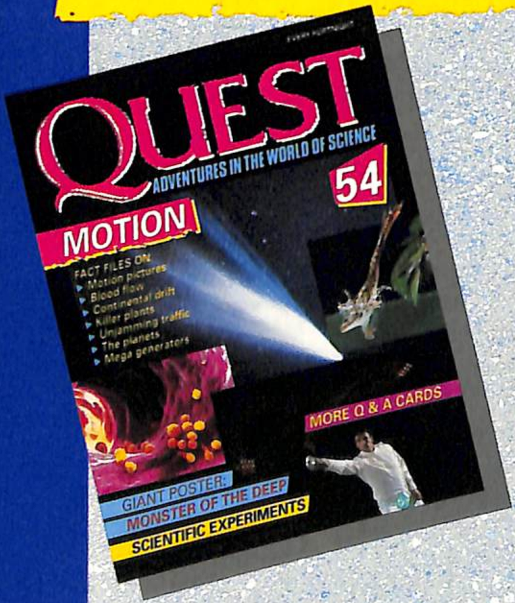
▶ The fast track to success ▶ Racing animals ▶ Heavy metal at the drag strip ▶ Exercise in Space ▶ Fine tuning athletes ▶ The record breakers ▶ Trans-continental races

MODEL 4-wheel drive jeep

POSTER
The ski devils

PROJECT SHEET

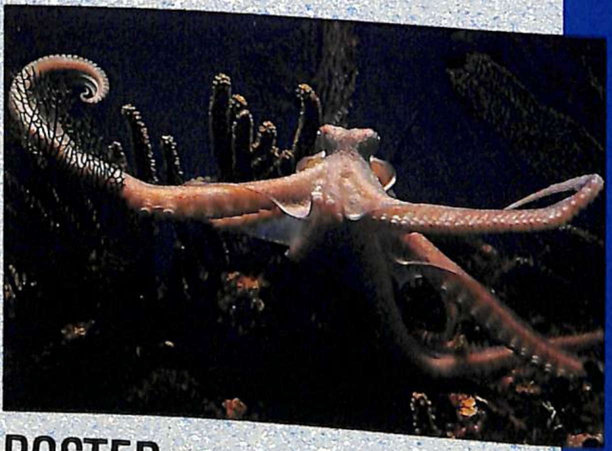
COMING IN QUEST 54 MOTION



FACT FILES INCLUDE:

▶ Unjamming traffic
▶ Inside blood
▶ Motion pictures
▶ Generators
▶ Plants that move
▶ The changing heavens
▶ Drifting continents

PLUS
In-Quest Q&A cards



POSTER
Creatures from the deep

ISSN 1350-3766
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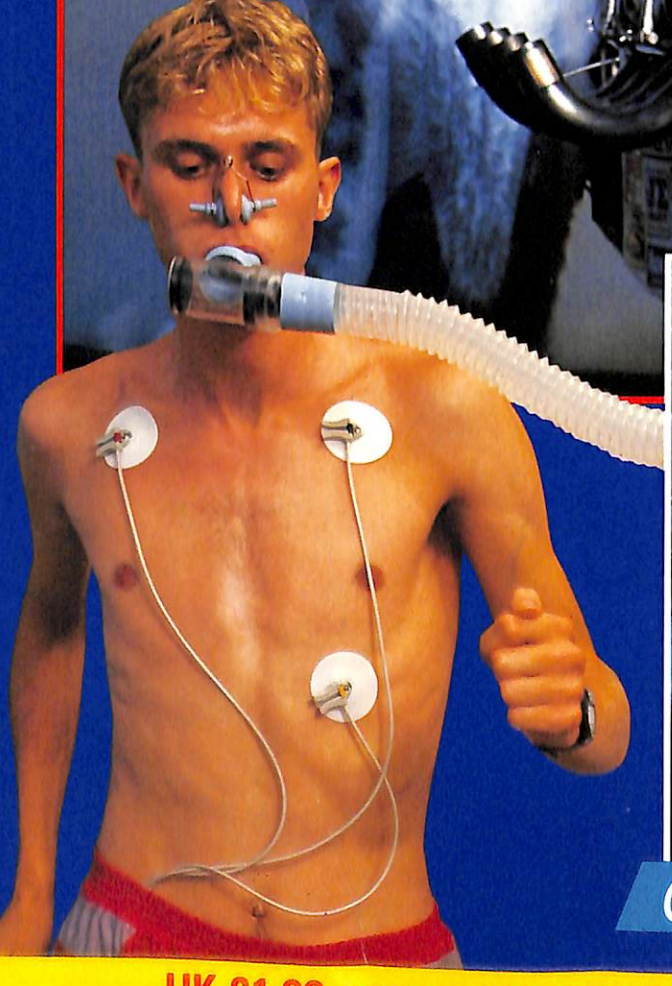
EVERY FORTNIGHT

QUEST

ADVENTURES IN THE WORLD OF SCIENCE

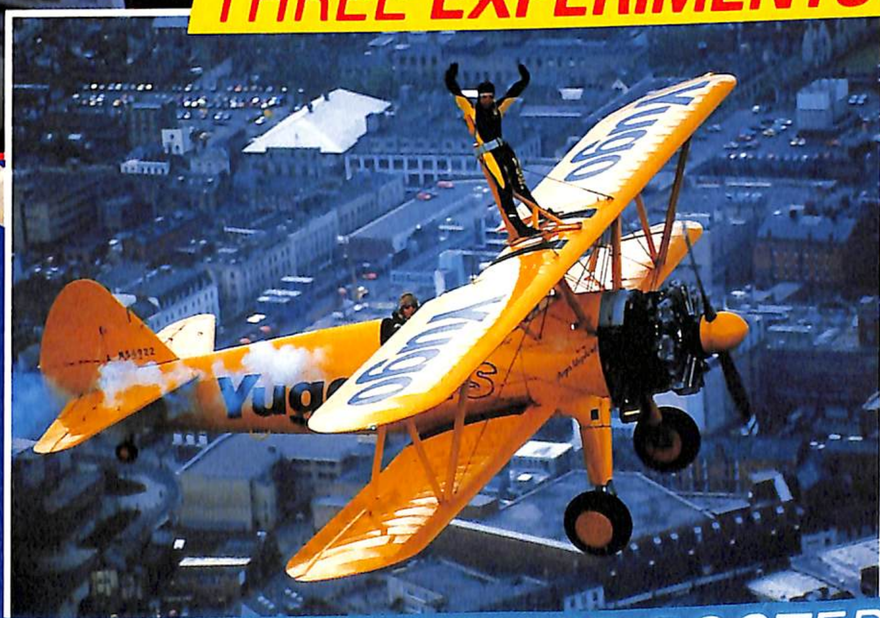
CHALLENGES 53

FACT FILES ON:
- Dragsters
- Hi-tech training
- Weird feats
- Space exercise
- Crazy races
- Animal heroes



MAKE A MONSTER TRUCK

THREE **EXPERIMENTS**



GIANT **SPEED SKIER** POSTER

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FULLY SOR

Q PROJECTS

CHALLENGES

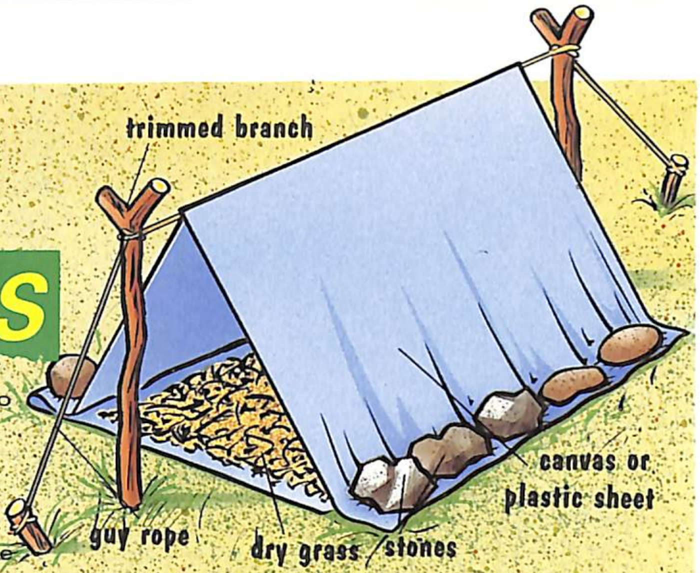
Caught out in the open, one of the first challenges is to build a shelter.

BUILD A TENT

1 2 3 4 5

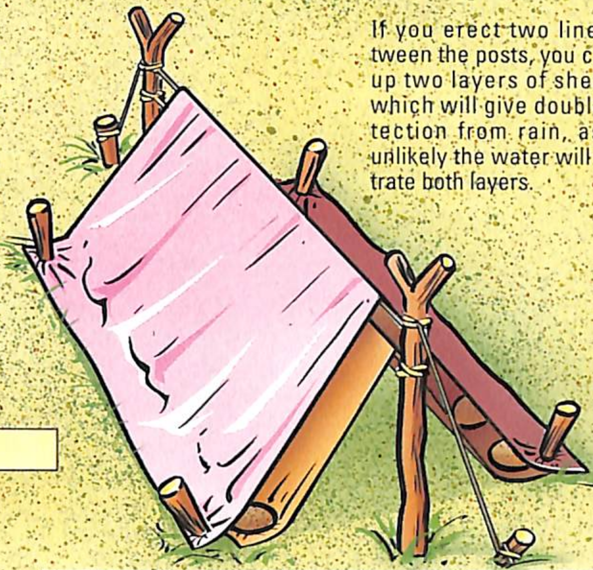
With just some sheeting and a rope, you can improvise a tent that will protect you from wind and rain.

Find two branches, each with a cleft about the same length along the wood. Bury the straight end of each branch in the ground, about 2 metres apart, so they stand stable and erect. If possible, build on a slight downward slope that will allow any surface water to drain away. Put up a line between the two branches, winding the rope around the clefts in both the branches. Hammer two smaller pieces of wood into the ground (as shown). Tie one end of the rope securely to one wooden peg. Then tie the other end of the rope to the other peg, so that the rope is taut along its entire length. Drape a piece of canvas or plastic sheeting over the rope and weigh the edges of the sheet down with rocks. If it is long enough, tuck the sheet under to form a groundsheet inside the tent. Lay plenty of dry grass or ferns on the floor of the tent, as a barrier between you and cold or damp ground.



Simon Critchley

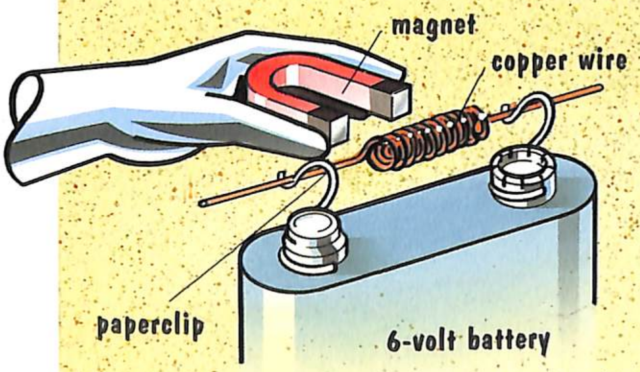
If you erect two lines between the posts, you can put up two layers of sheeting, which will give double protection from rain, as it is unlikely the water will penetrate both layers.



ADVENTURES IN THE WORLD OF SCIENCE

A SIMPLE ELECTRIC MOTOR

1 2 3 4 5

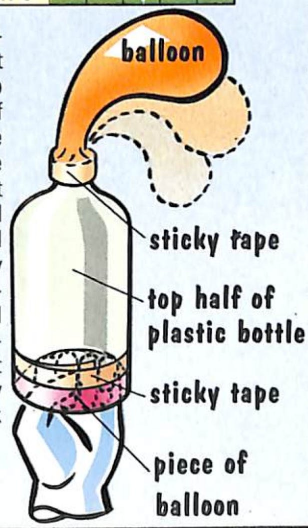


You need a 6-volt battery, two paper clips, 25-30 cm of copper wire, some sandpaper, a pair of pliers and a magnet. First bend the two paper clips into an 'S' shape. Wrap the bottom loop of one 'S'-shaped paperclip around one terminal and wrap the other paperclip around the other terminal in the same way. Carefully bend the copper wire into a coil, leaving 10 cm of straight wire at either end. Rub both ends of the copper with sandpaper to increase their conductivity. Balance the coiled copper wire over the S bend of the paper clips. Hold the magnet near the coil and your motor should rotate.

HOW THE LUNGS WORK

1 2 3 4 5

You need a plastic washing-up bottle, a pair of scissors or a craft knife, some sticky tape and two balloons. Cut the bottle in half across the middle. Place one of the balloons over the neck of the bottle and secure it with sticky tape. Cut the second balloon in half and stretch the rubber over the cut end of the bottle. Secure it with sticky tape. Push the balloon at the bottom and the balloon at the top will expand. When you release the balloon at the bottom the balloon at the top will deflate. This is the way your lungs and diaphragm work when you breathe in and out.



PROJECT INFORMATION

1 2 3 4 5

Each **QUEST** project and model has its own difficulty rating: 1 very simple, 2 simple, 3 intermediate, 4 advanced, 5 complicated.

WARNING!

Every care has been taken to ensure projects are as safe as possible. However, parents should supervise all projects. The publisher can accept no liability for injury.

MODEL
ASSEMBLY INSTRUCTIONS

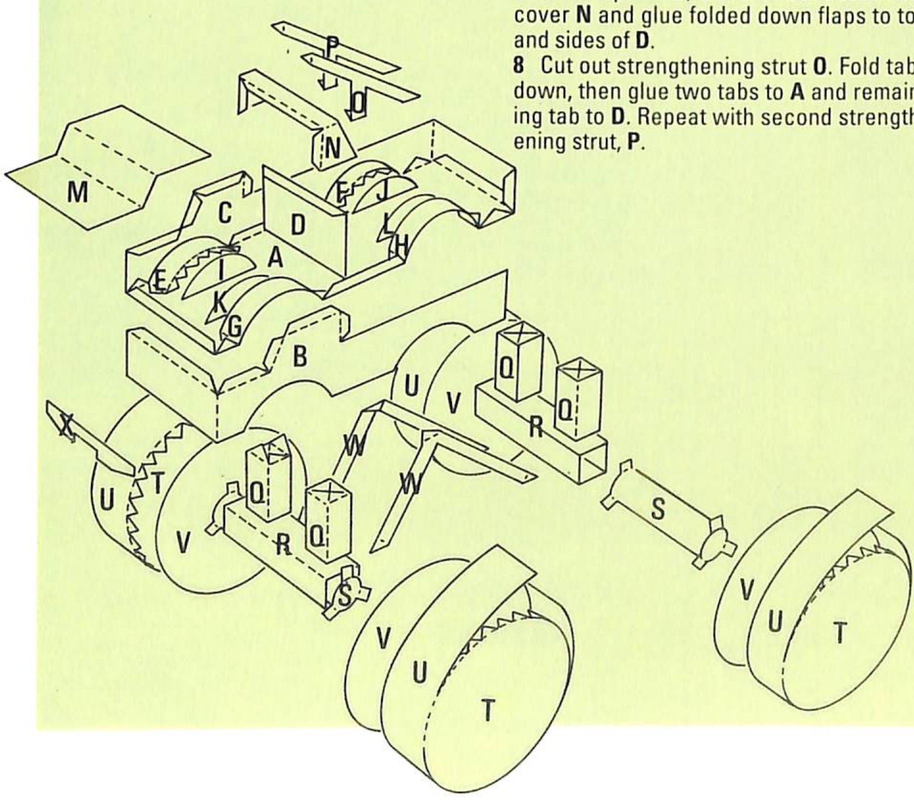
1 2 3 4 5

MONSTER JEEP

You will need
Scissors • Ruler • Craft knife • Glue

Before cutting out the pieces, score along all broken lines with a blunt edge and ruler to make folding and gluing easier. Study the ASSEMBLY DIAGRAM to see how the pieces fit together, and use the dotted lines as a guide for positioning.
NB Younger children will need supervision when using a craft knife.

To make up
Body
1 Cut out floorpan **A** and fold all flaps up. **NB** The surface that includes positioning marks is the underside.
2 Cut out body side and front **B** and fold into shape. Stick **B** to **A**, spreading glue on tabs on side and front of **A**. Repeat with body side and rear **C**.
3 Cut out rear window **D**, fold flap forward and glue into position by sticking **D** to tab behind window on **B** and to tab similarly placed on **C**.
4 Cut out wheel arch **E**, spread glue on underside of end tabs and stick to front wheel cutaway on **C**, so curve on **E** matches curve on **B** (see ASSEMBLY DIAGRAM).
5 Cut out wheel arches **F**, **G** and **H**. Attach **F** in the same way to rear wheel cutaway on **C**, **G** to front wheel cutaway on **B** and **H** to rear wheel cutaway on **B**.
6 Cut out **I** and stick to folded down tabs on wheel arch **E**. Repeat with **J**, **K** and **L**, sticking **J** to **F**, **K** to **G** and **L** to **H**.
7 Cut out roof, windscreen and bonnet **M**. Glue to flaps on **B**, **C** and **D**. Cut out roll bar cover **N** and glue folded down flaps to top and sides of **D**.
8 Cut out strengthening strut **O**. Fold tabs down, then glue two tabs to **A** and remaining tab to **D**. Repeat with second strengthening strut, **P**.



Suspension and wheels
1 Cut out four Superlift springs, all marked **Q**. Glue each one into shape and stick it to underside of **A**, following positioning marks.
2 Cut out shock absorbers **R** and glue to shape. Stick **R** to front two Superlift springs **Q**, following positioning marks. Repeat with second shock absorber, also marked **R**, gluing it to rear Superlift springs.
3 Cut out **S**, roll into tube shape small enough to push through **R** and stick flap in place. Repeat with other part **S**.
4 Cut out earth-mover wheel parts **T**, **U** and **V**. Fold down tabs on **T** and spread glue on them. Next, wrap tyre tread **U** around **T**. Stick other side of wheel **V** on to folded down tabs on **U**. Repeat to make up three more wheels.
5 Fold back tabs at one end of **S** and glue undersides of tabs to side **V** of one wheel, following positioning dots. Push other end of **S** through front shock absorbers **R** (see ASSEMBLY DIAGRAM). Glue tabs at free end of **S** to side **V** of another wheel. To attach rear wheels to body, repeat above directions.
6 Cut out suspension bars **W** and glue into position on underside of **A**. Stick tab at apex of **W** to positioning marks on **A**. Glue end tabs to outer edge of front and rear shock absorbers **R**. Repeat with second set of suspension bars, also marked **W**.
7 To finish, cut out bumper **X** and stick into position on front of cab **B**.

Jean Marc Barey/Vandystadt/Allsport

French skier Bernard Gervasoni *attempted to set a new world speed record – by attaching turbine motors to his ski boots. What had seemed like a good idea in principle, proved disastrous in practice – the vibrations were so strong that Gervasoni had to give up at the first attempt.*

Vandystadt/Allsport

FASTEST SKIER ON EARTH

In April 1988, downhill skier Michael Prufer of Monaco broke the world speed record by reaching 223.741 km/h. His record was set in a speed competition, called *Ski de Vitesse,* organized by the International Ski Federation. The event, which is held annually in the French Alps, is open to amateur as well as professional skiers and attracts participants from all over the world.

The race takes place over a very steep, ice-covered slope, 1 kilomètre in length. Skiers gather momentum on the first section of the course and their speed is measured over a 100 metre-long, 15 metre-wide 'speed corridor' between the 400-500 metre marks. The slope quickly levels out to allow the speed skiers to slow down.

The competitors' suits and equipment are adapted for use at high speeds and must conform to the organizers' safety standards. Skis must not exceed 2.40 metres in length and weigh no less than 15 kg a pair. Pruffer's skin-tight, lightweight suit, aerodynamic helmet and winglets attached to his calves were designed to maximize speed and reduce air resistance to a minimum.

A new women's speed record was set in the same year, at the same event, when Tarja Mulari of Finland reached 213.413 km/h. And Frenchman, Patrick Knaff, set a one legged downhill ski speed record of 185.567 km/h.

SKI WHIZZ

ALPINE RECORD BREAKER

MONSTER JEEP